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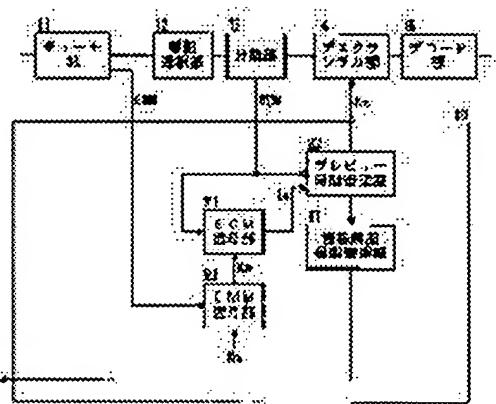
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(54) BROADCAST RECEIVER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a broadcast receiver that displays preview of pay broadcast programs in diversified forms.

SOLUTION: A broadcasting station broadcasts entitlement control message ECM that includes information of a preview permission time. The broadcast receiver is provided with an ECM decoding means 21 that decodes a scramble key Ks from the received ECM, a descramble means 14 that uses the decoded scramble key to descramble video audio information of programs, and a preview time management means 23 that controls the use of the scramble key for the descramble means 14 based on preview permission information included in the ECM. Thus, the programs are previewed based on the preview permission time designated by the ECM.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention enables it to diversify a setup of a preview especially about the broadcast receiving set which displays the receiving image at the time of a preview according to the time amount specification method and approach of "a preview" which introduces a part of pay program of digital broadcasting for nothing.

[0002]

[Description of the Prior Art] Contracts are beforehand exchanged with the pay per view which pays a tariff afterwards to the program to which it viewed and listened in charged broadcast, and there are two kinds of prior contract methods which enable viewing and listening of the program of a contract within the limits of them.

[0003] If "purchase" is chosen from the purchase selection screen displayed on a screen when you watch the pay program of pay per view, the scramble of the program will solve, viewing and listening will become possible, and the viewing-and-listening hysteresis of the program to which it viewed and listened to coincidence will be recorded on a broadcast receiving set. This viewing-and-listening hysteresis is transmitted to a pin center, large through a communication line later, and the tariff corresponding to that viewing and listening is charged directly to a viewer's bank account.

[0004] Conventionally, in such a pay-per-view program, in order to introduce the contents of a program and to aim at the increment in a viewer, the "preview" which shows a part of the program for nothing is performed. Only the method which previews over predetermined time from the time of a viewer choosing a pay-per-view program, and the head of a pay-per-view program to predetermined time has two kinds with the method with which a preview becomes possible in this preview.

[0005] The tuner section 11 as which the receiving set which receives charged broadcast chooses a channel as shown in drawing 7, The program selection section 12 which chooses a program, and the separation section 13 which separates the data of the image and speech information of a program, or program information from the selected information, The descrambling section 14 which descrambles an image and speech information using the decoded scramble key (Ks), The decoding section 15 which decodes the image and speech information which it descrambled, management of viewing-and-listening hysteresis, decode of a code, etc. are equipped with the security module 10 which performs actuation which requires a secret.

[0006] The security module 10 consists of IC cards sent from a broadcasting station, and possesses the preview time management section 18 which manages preview time amount, the timer section 16 which measures preview time amount, the viewing-and-listening hysteresis Research and Data Processing Department 17 which records viewing-and-listening hysteresis and reports to a broadcasting station, and the decode sections 19 and 20 which decode a code and decode a scramble key.

[0007] Encryption by charged broadcast is performed using three kinds of keys. First, the image and speech information of a program are scrambled with a scramble key (Ks), this scramble key is enciphered with a work-piece key (Kw), and a work-piece key is enciphered with a master key (km). A

scramble key (Ks) is a key common to each receiving set updated the short period of about 1 second. Moreover, a work-piece key (Kw) is assigned according to an individual, and is updated with the period of about one year. The master key (km) is memorized by the security module of each receiving set. [0008] A broadcasting station multiplexes and broadcasts the image and speech information of the program scrambled with the scramble key (Ks), the information on the scramble key (Ks) enciphered with the work-piece key (Kw), and the information on the work-piece key (Kw) enciphered with the master key (km).

[0009] In a receiving set, the separation section 13 separates the information on the work-piece key (Kw) enciphered with the master key (km), it outputs to the decode section 20, and the decode section 20 decodes a work-piece key (Kw) using a master key (km). The separation section 13 separates the information on the scramble key (Ks) enciphered with the work-piece key (Kw) again, outputs it to the decode section 19, and the decode section 19 decodes a scramble key (Ks) using the work-piece key (Kw) decoded in the decode section 20, and it outputs it to the descrambling section 14. The descrambling section 14 descrambles the image and speech information of a program using the decoded scramble key (Ks).

[0010] When a pay-per-view program is chosen by the viewer, the preview time management section 18 initializes the timer section 16, makes measurement of preview time amount start, and makes the decoded scramble key (Ks) output to the descrambling section 14 from the decode section 19 by the method to which a preview is performed over predetermined time from a viewer's program selection time.

[0011] If shift guidance on a purchase actuation screen is displayed and the shift to a purchase actuation screen is chosen, it will shift to a pay-per-view purchase screen, at the same time the timer section 16 measures predetermined time. And when the purchase procedure of a pay-per-view program is made to perform to the viewing-and-listening hysteresis Research and Data Processing Department 17 and a viewer chooses the purchase of a program, the viewing-and-listening hysteresis is made to record. Moreover, when a viewer does not choose the purchase of a program, the output of the scramble key (Ks) from the decode section 19 is stopped.

[0012] Moreover, when the program from which a viewer differs is chosen before the timer section 16 finished measuring predetermined time, the preview time management section 18 stops the timer section 16 temporarily (a condition is held). Then, if the program in which the viewer was previewing is chosen again, the preview time management section 18 will make actuation of the timer section 16 resume, and will measure a continuation of preview time amount.

[0013] On the other hand, only the head of a pay-per-view program to predetermined time is in the method to which a preview is set at the broadcast time of a pay-per-view program, and a broadcasting station sends out a program, without only predetermined time applying a scramble from the head of a program.

[0014]

[Problem(s) to be Solved by the Invention] However, there are the following problems in the conventional preview specification method.

[0015] By the method to which a preview is set over predetermined time from a program selection time, since a preview is started from the time of a viewer choosing a program as arbitration, the prohibition section of a preview cannot be set up. Therefore, viewing and listening of Climax of a program etc. will be attained as a preview.

[0016] Moreover, as for a preview, only predetermined time becomes impossible from the head of a pay-per-view program, when the non scramble time amount passes by the method to which a preview is set. Therefore, a suitable preview can necessarily be performed from a head to a program like variety to which it is not necessary to view and listen, for example.

[0017] This invention aims at solving such a conventional trouble, offering the preview specification method which can diversify a setup of a preview, and offering the broadcast receiving set which displays the preview of charged broadcast according to the approach.

[0018]

[Means for Solving the Problem] Then, he is trying to include the information on preview authorization time amount in this invention into ECM (Entitlement Control Message) broadcast from a broadcasting station.

[0019] Moreover, an ECM decode means to decode a scramble key from ECM which received, a descrambling means to descramble the image speech information of a program using the decoded scramble key, and a preview time management means to control use of the scramble key in a descrambling means based on the preview authorization information included in ECM are formed in the broadcast receiving set.

[0020] ECM is used in order to send the enciphered scramble key (ks) to each broadcast receiving set, and it is broadcast by the short fixed time period. Assignment of a preview with various gestalten is attained by including the information on preview authorization time amount in this ECM.

[0021]

[Embodiment of the Invention] In the preview specification method in charged broadcast, from a broadcasting station, invention of this invention according to claim 1 transmits ECM including the information on preview authorization time amount to a broadcast receiving set, and can specify the preview of various gestalten by the method of a setup of the preview authorization time amount in ECM.

[0022] Invention according to claim 2 enables it to specify preview authorization time amount with the receiving number of ECM, can count ECM broadcast by the short fixed time period, and can specify time amount.

[0023] Invention according to claim 3 specifies preview authorization time amount in the real time from the current time contained in ECM, and the time amount of a preview which becomes possible from now is specified in the real time.

[0024] As preview authorization time amount, invention according to claim 4 is made to carry out a sequential setup of the value which decreases every [1], respectively, and preview authorization time amount carries out sequential reduction with time amount progress, and it goes to continuous ECM.

[0025] As preview authorization time amount, invention according to claim 5 sets the same values other than zero as continuous ECM, respectively, and can specify the preview of live broadcast as it dynamically.

[0026] As preview authorization time amount of the period which forbids a preview, invention according to claim 6 sets up 0, and can set up a preview prohibition period.

[0027] It is made for invention according to claim 7 to transmit including ECM which specifies neither preview authorization time amount nor the ban on a preview, and only when being viewed and listened to broadcast in the time zone before this nonappointed ECM is broadcast, it becomes possible [specifying authorization of a preview].

[0028] An ECM decode means to decode a scramble key from ECM which invention according to claim 8 received, In a broadcast receiving set equipped with a descrambling means to descramble the image speech information of a program using the decoded scramble key Based on the preview authorization information included in ECM, a preview time management means to control use of the scramble key in a descrambling means is established, and viewing and listening of a preview is attained based on the preview authorization time amount specified by ECM.

[0029] It becomes possible only for the preview authorization time amount which formed the timer which clocks the counter or the real time which counts the number of reception of ECM in the preview time management, means, measured for it the preview authorization time amount set as ECM with the counter or the timer, and was specified as it by ECM to view and listen [of a preview] invention according to claim 9.

[0030] Hereafter, the gestalt of operation of this invention is explained using a drawing.

[0031] In the preview specification method of an operation gestalt, a broadcasting station tells the authorization information on a preview to a receiving set using ECM.

[0032] Although the broadcasting station transmitted the individual information and contract information about the enciphered work-piece key (Kw) to the receiving set by EMM (Entitlement

Management Message) and has transmitted the program information about the enciphered scramble key (Ks), the category of a program, etc. by ECM, by the approach of this operation gestalt, ECM of these was used for it and it has told the information on preview authorization time amount to the receiving set.

[0033] This ECM consists of a section header 31, an ECM body 32, and CRC33 for error corrections, as shown in drawing 3. The ECM body 32 It consists of enciphered Ks34, Tia information 35 which shows the range of the contract to which it can be viewed and listened, preview authorization information 36, and current time 37. Furthermore, the preview authorization information 36 Furthermore, it consists of time amount mode 38 which shows the assignment mode of preview authorization, and preview authorization time amount 39 which shows the time amount to which a preview is permitted.

[0034] This ECM is usually transmitted at intervals of about 1 second, in order to tell enciphered Ks34. There are two kinds in in the "real-time mode" which specifies preview authorization time amount in the real time, and the "receiving number mode" in which count the receiving number of ECM and preview authorization time amount is specified in the class in time amount mode 38. A hour entry will be acquired even if it counts the receiving number of ECM, since ECM is transmitted with a fixed time interval.

[0035] The tuner section 11 which separates EMM from receipt information while the broadcast receiving set of an operation gestalt chooses a channel, as shown in drawing 1, The separation section 13 which separates ECM of the image and speech information of a program, and program information from the information chosen with the program selection section 12 which chooses a program, The descrambling section 14 which descrambles an image and speech information using the decoded scramble key (Ks), It has the decoding section 15 which decodes the image and speech information which it descrambled, and the security module 10. The security module 10 The EMM decode section 22 which decrypts the work-piece key in EMM (Kw) using a master key (km), The ECM decode section 21 which decodes the scramble key in ECM (Ks) using the decoded work-piece key (Kw), Preview time amount was managed based on ECM, and it has the preview time management section 23 which controls the output to the descrambling section 14 of the decoded scramble key (Ks), and the viewing-and-listening hysteresis Research and Data Processing Department 17 which records viewing-and-listening hysteresis and reports to a broadcasting station.

[0036] Moreover, the separation section 43 which separates the preview authorization information 36 from ECM which received as the preview time management section 23 is shown in drawing 2, In the preview authorization Research and Data Processing Department 42 which manages preview authorization time amount based on the separated preview authorization information 36, and receiving number mode In the ECM receiving counter 44 which counts the count of reception of ECM, and real-time mode It has the subtraction timer section 45 which measures the residual time of preview authorization time amount, and Ks output-control section 41 which controls Ks outputted to descrambling 14 based on the information of the preview authorization Research and Data Processing Department 42.

[0037] In this receiving set, the tuner section 11 and the program selection section 12 choose a program based on the directions from a viewer. The tuner section 11 extracts EMM and outputs it to the EMM decode section 22 again. The separation section 13 separates the image and the selected speech information, and selected ECM of a program. The EMM decode section 22 decrypts Kw enciphered in EMM using Km memorized by the security module. The ECM decode section 21 decrypts Ks enciphered in ECM using Kw decoded in the EMM decode section 22, and outputs it to the preview time management section 23.

[0038] The preview time management section 23 performs preview control based on the preview authorization information included in ECM using Ks received from the ECM decode section 21. The viewing-and-listening hysteresis Research and Data Processing Department 17 carries out purchase procedure of a pay-per-view program based on directions of the preview time management section 23. The descrambling section 14 descrambles a program based on the directions from the preview time

management section 23. The decoding section 15 decodes the program which it descrambled in the descrambling section 14.

[0039] Next, the preview control performed in the preview time management section 23 is explained. At drawing 4, each time of day t1, t2, and t3 and the preview authorization time amount sent to -- are illustrated by ECM of Program A. Here, the case where the time amount mode 38 is receiving number mode is shown, and each numeric value which ECM expresses shows that a preview is permitted until the receiving number of ECM reaches the numeric value. Therefore, as shown in 51, when a numeric value is "5", the period which receives ECM 5 times successingly turns into preview authorization time amount. A viewer chooses Program A as time of day t8, and when the numeric value of ECM at that time is 5, a preview is permitted until the count of reception of ECM amounts to 5 times.

[0040] Moreover, as shown in 52, it is shown that "0" of the numeric value of ECM is a preview prohibition period. Therefore, a viewer chooses Program A as time of day t14, and a preview is not permitted when the numeric value of ECM at that time is 0.

[0041] Moreover, after the period when the numeric value is continuing, and its repeat are completed when the same numeric values other than zero are repeated as shown in 53, a period until it counts the receiving number corresponding to the numeric value turns into preview authorization time amount. Therefore, when a preview is permitted and a viewer chooses Program A as time of day t20 only while it continued, when ECM of "1" continued like 53, a preview becomes possible till time of day t23. By taking such a specification method, the preview authorization time amount of live broadcast can be set up dynamically.

[0042] Moreover, "-" shown in 54 expresses the nonappointed condition that ECM specifies neither preview authorization nor the ban on a preview. A preview will not be possible when ECM at the time of choosing Program A first is "-", since a preview is not permitted positively.

[0043] In addition, although ECM specifies the preview of the time amount of which is permitted from current time 37 in the real time (for example, second unit) when the time amount mode 38 is real-time mode, the method of assignment in this case is the same as the case where the receiving number of ECM is specified substantially.

[0044] The separation section 43 of the preview Management Department 23 separates the preview authorization information 36 from ECM which received, and passes it to the preview authorization Research and Data Processing Department 42 while it will notify reception of ECM to the ECM receiving counter 44, if ECM inputs.

[0045] The preview authorization Research and Data Processing Department 42 divides into the time amount mode 38 and the preview authorization time amount 39 the preview authorization information 36 passed from the separation section 43. And when the time amount mode 38 is receiving number mode, the preview authorization time amount 39 is set to the ECM receiving counter 44. Whenever the ECM receiving counter 44 receives a notice from the separation section 43, it subtracts a counter, and as a result of subtraction, if a counter is set to 0, it will notify the preview authorization Research and Data Processing Department 42 of that.

[0046] Moreover, when time amount mode is real-time mode, the preview authorization time amount 39 expressed with the real time is set to the subtraction timer section 45. The subtraction timer section 45 notifies the preview authorization Research and Data Processing Department 42 of that, when a timer is subtracted in the real time and time amount becomes zero or less.

[0047] If the preview authorization Research and Data Processing Department 42 displays shift guidance on a purchase actuation screen at the same time it receives a notice from the ECM receiving counter 44 or the subtraction timer section 45, and the shift to a purchase actuation screen is chosen, it will shift to a pay-per-view purchase screen. And when the purchase procedure of a pay-per-view program is made to perform to the viewing-and-listening hysteresis Research and Data Processing Department 17 and a viewer chooses the purchase of a program, the viewing-and-listening hysteresis is made to record. Moreover, when a viewer does not choose the purchase of a program, an output halt of a scramble key (Ks) is notified to Ks output-control section 41. Ks output-control section 41 will suspend the output of decrypted ks, if a notice is received from the preview authorization Research and Data

Processing Department 23.

[0048] Moreover, the preview authorization Research and Data Processing Department 42 stops the output of ks to Ks output-control section 41, when the preview authorization time amount in ECM which received is 0, it is made to shift to a purchase selection screen immediately and a viewer does not choose the purchase of a program.

[0049] Drawing 5 shows the preview specification method with which a preview is permitted only to the viewer who viewed and listened to CM. In this case, preview authorization time amount is specified as ECM which transmits during CM period, and ECM of broadcasting hours after CM is completed presupposes that it is nonappointed. In the example of drawing 5, when Program A is chosen as the time of day t8 under CM televising, a preview is permitted till time of day t20, but a preview is not permitted when Program A is chosen as the time of day t14 after CM televising.

[0050] Moreover, drawing 6 shows the preview specification method at the time of changing program selection in the middle of a preview period. It views and listens to Program A from time of day t8, and when the numeric value of ECM which received then is "9", a preview while receiving nine ECM about Program A (9t) is permitted. Suppose that the channel was changed at Program B at time of day t11 after viewing and listening only to 4t of previews of Program A.

[0051] The preview authorization time amount of Program B is the numeric value "8" of ECM which received at the time. If a channel is again changed to Program A at time of day t18 after viewing and listening to the preview of Program B, the preview authorization time amount of the program A at this time will turn into the residual time of the preview authorization time amount about Program A, i.e., 5t, (= 9t - four t). Therefore, even if ECM in the time of day t18 of Program A is nonappointed, it can view and listen to a preview till time of day t22.

[0052]

[Effect of the Invention]. Since preview information is told using ECM, by this invention, various gestalten can be specified about the preview of a pay-per-view program, so that clearly from the above explanation.

[0053] For example, a preview prohibition period can be set up, the preview of a live program can be specified dynamically, and a preview can be specified a condition [viewing and listening of CM etc.].

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1] The preview specification method in the charged broadcast characterized by transmitting ECM including the information on preview authorization time amount to a broadcast receiving set from a broadcasting station.

[Claim 2] The preview specification method according to claim 1 characterized by specifying said preview authorization time amount with the receiving number of ECM.

[Claim 3] The preview specification method according to claim 1 characterized by specifying said preview authorization time amount in the real time from the current time contained in ECM.

[Claim 4] The preview specification method according to claim 2 or 3 characterized by carrying out a sequential setup of the value which decreases every [1] to continuous ECM, respectively as said preview authorization time amount.

[Claim 5] The preview specification method according to claim 2 or 3 characterized by setting the same values other than zero as continuous ECM as said preview authorization time amount, respectively.

[Claim 6] The preview specification method according to claim 2 or 3 characterized by setting up 0 as said preview authorization time amount of the period which forbids a preview.

[Claim 7] The preview specification method according to claim 1 characterized by transmitting including ECM which specifies neither preview authorization time amount nor the ban on a preview.

[Claim 8] The broadcast receiving set carried out [having established a preview time-management means controlled use of the scramble key in said descrambling means based on the preview authorization information included in ECM in a broadcast receiving set equipped with an ECM decode means decode a scramble key, and a descrambling means descramble the image speech information of a program using the decoded scramble key from ECM which received, and] as the description.

[Claim 9] The broadcast receiving set according to claim 8 characterized by measuring the preview authorization time amount which possessed the timer with which said preview time management means clocks the counter or the real time which counts the number of reception of ECM, and was set as said ECM with said counter or timer.

[Translation done.]